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24 January 1986

EAST EUROPE REPORT

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AGRICULTURE

INTERNATIONAL AFFAIRS

CURRENT 5-YEAR PLAN PROGRESS REPORT FOR CEMA AGRICULTURE

Moscow/East Berlin INTERNATIONALE ZEITSCHRIFT DER LANDWIRTSCHAFT in German No 6,
1985 pp 480-485

[Article by Ngok Bin and Petr Ivashov, agriculture department, CEMA secretariat:
"Agricultural Development in the CEMA Countries During the Current Five-Year Plan"]

[Text] The communist and workers parties in the CEMA countries look at stably supplying the population with foods as an exceptionally important economic and sociopolitical task. Its successful solution is sought by each country's resolutely implementing its agrarian policy and by the coordinated commercial and economic policy in the integration process of the countries of the socialist community. The principal goal lies in obtaining stable growth in food production and an improvement in the food supply structure for the population through using the CEMA countries' potential, the accomplishments of scientific-technical progress and the best practical experiences. That policy found its concrete expression in the preparation and adoption of specific long-term food programs and other important documents in some CEMA countries, where complex material-technical, socioeconomic and organizational measures were set down on the proportionate development of all branches in the agrar-industrial complex (AIK), especially of its central sphere, agriculture.

The fraternal countries closely coordinate the national development programs for the AIK branches with the chances arising for the implementation of these programs from the multilateral international cooperation and the specialization and integration in the agro-industrial sector within CEMA.

The 37th CEMA session in 1983 discussed and approved, in complementing the long-term target program for cooperation in agriculture and the foodstuffs industry, "complex cooperation measures for improving the supplying of the population of the CEMA countries with food." They embrace a broad number of tasks in economic and scientific-technical cooperation in the branches of AIK.

Combining the national and international efforts of the CEMA countries around the solutions for the problems that are connected with the development of AIK has positively affected the increase in food production. The agricultural working people in the CEMA countries (somewhat more than the 6 percent of agricultural workers on the world scale) greatly boosted the output of the most important farm products in recent years, relative to world production (Table 1).

Table 1: The CEMA countries' proportionate share in world output of the most important agricultural products, in percent

Products	1980	1984
Grain and leguminosae	17.8	19.4
Sugar beets	44.2	44.8
Potatoes	49.0	50.0
Milk	28.1	30.0
Wool	21.1	21.0
Eggs	20.0	20.5

Meteorologically, this Five-Year Plan (1981-1984), especially the first 2 years, was extremely unfavorable to farming in some CEMA countries. However, the states in the socialist community concentrated their efforts on solving the many topical and long-range tasks contributing to a consolidation of the material-technical base in agriculture, to expanding amelioration projects, to technical conversion in agriculture as well as to putting into practice progressive technologies, the accomplishments of science and the experiences of the best units. Against the natural forces they pitted the organized and exemplary labor of the working people in crop and livestock production and increased the farm output under tough weather conditions.

Investments to Consolidate and Develop the Material-Technical Base in Agriculture

Among the measures for solving the food problem, investments and rational use play an important role. Between 1981 and 1984 total investments, compared with 1980, rose by 22 percent in Bulgaria (not counting the allocations for reforestation), by 98 percent in Vietnam, by 11 percent in Cuba, by 71 percent in Mongolia, and by 25 percent in the CSSR. In other CEMA countries the average annual investment rate slowed down.

At the present time, the chief investment trends in agriculture lie in the reconstruction and modernization of existing capacities and in technical conversion and amelioration to increase the intensity and efficiency of crop and livestock production and improve soil fertility.

Another peculiarity of the use of investments in the current five-year plan lies in the elimination of still surviving disproportions in the development of the AIK branches and their infrastructure.

The proportionate share of investments in agriculture and the foodstuffs industry relative to total investments is 11 percent in the GDR, 22 percent in Poland, and more than one-third in Cuba. In Mongolia, circa 17 percent were annually used in this period for agricultural development and in Vietnam, 20 percent of total investments in the economy. They were used mainly for building irrigation systems, creating new land, expanding the growing of technical cultures, and setting up new state-farms. In Romania, 16 percent of all investments went to agriculture in the 1981-1984 period. They put 43 projects into operation, including irrigation systems and cattle breeding and fattening installations. Large amelioration projects were carried out.

In the Soviet Union, the proportion of investments in agricultural development came to 20 percent of the economic investment effort in the seventh Five-Year Plan,

23 percent in the eighth, 26 percent in the ninth, and 27 percent in the 10th and the 4 years of the 11th five-year plan. In its agrarian policy the CPSU pays great attention to enhancing the stability of farm production as an important prerequisite for the planned development of the entire economy. Amelioration tasks are getting primary attention there. The October 1984 plenum of the CPSU Central Committee ratified a long-term program on amelioration and the efficient use of ameliorized areas for the 12th five-year plan and the long-range time frame up to the year 2000. This program provides for more than R 50 billion of state investments for the years 1986-1990. By the year 2000 up to 32 million hectares are to be irrigated and 19 to 21 million hectares, to be dried.

For developing and reinforcing the material-technical base of agriculture in the CEMA countries is its technical equipment and conversion and, on that basis, the initiation of a complex mechanization of farm production very important.

Agriculture in the CEMA countries got new tractors and farm machinery. In 1984 there were as many as 4,191,200 tractors (not counting Romania), as compared with 3,631,000 in 1980, an increase thereby of 15 percent. Other than the larger number of tractors and other machines, there came their technical upgrading and the addition of higher-capacity modern tractors of the K-700, K-701, T-150, T-150K, MTS-80, MTS-82 and other models. Simultaneously, the CEMA countries' agriculture is being equipped with technically improved highly productive combines for the grain, potato, beet and vegetable harvest, means of transportation and strong trailers, and machine systems for livestock and feed production.

Between 1980 and 1983, the energy installation in agriculture in the CEMA countries rose from 285 to 298 hp per 100 ha of acreage, in Hungary from 192 to 211 hp, in Poland from 308 to 371, in the USSR from 270 to 307, and in the CSSR from 438 to 478 hp.

The increasing extent of technical and energy equipment in farm production makes possible mechanizing more and more production processes in crop and livestock production, whereby labor productivity is boosted. In the European CEMA countries, plowing, all the seeding, silage and hay preparation, the harvesting of grain, leguminosae and oleaginous plants, organic and mineral fertilizing, and chemical herbicide, insecticide and weeding operations are fully mechanized, and so are many projects in livestock production, especially in cattle and poultry installations with an industrialized setup. In the USSR, for instance, the mechanization degree in 1983 in the milk production installations came to 99 percent, in the cattle breeding plants to 94 percent, and in pig breeding to 92 percent. All told, however, the agricultural labor productivity in the CEMA countries, in spite of the expanded degree of technical equipment, rose but slowly.

What with farm product output retreating per unit of acreage in the years 1981/82, USSR agricultural labor productivity rose only 1 percent above that of 1976-1980, yet by 11 percent in 1983/84. Between 1976 and 1980, the direct labor expenditure (Kh/dt [manhours of work per dt (1 dt = 100 kg)] in the kolkhozes (including inter-enterprise facilities) came to 1.3 for sugar beets, 3 for potatoes,

53 for the cattle increase, 37 for that of pigs, 10 for milk, and in 1983 the appropriate proportions were 1.0; 2.6; 49; 37 and 9.

The comprehensive introduction of industrialized methods in crop and livestock production in conjunction with progressive forms of labor organization and remuneration has a great impact on higher labor productivity in the CEMA countries. According to the USSR ministry of agriculture, three-fourth of the maize in the Soviet Union, one-third of the sunflowers and more than 60 percent of the soy and sugar beets were industrially produced in 1984. In 1985, winter cultures and summer wheat were grown by means of intensive technologies on 17 million ha.

The transition to industrialized methods in farm production is being hastened greatly, and the efficiency with which they are used is being heightened. Many initiatives are simultaneously being aroused. Brigades and taskforces are assuming economic cost accounting and collective contracts and obligations that enhance the responsibility of each working person and of the entire work collective for the end product. In 1984, 40 percent of the acreage in the Soviet Union got regular taskforces that are working by collective contracts. In cattle production, 9 million cows, or 27 percent of the total, are taken care of by the assembly line system. Two-thirds of all pork is produced by conveyor belt technology in the public sector. An industrialized technology for sheep breeding is being introduced in complex mechanized breeding installations.

Also in the other CEMA countries are crop and livestock production placed on an industrialized basis. There still are branches, however, where scientific-technical progress makes but slow headway and labor expenditures are still extremely high. Thus far, for instance, the projects in vegetable and fruit growing, the growing and harvesting of some technical cultures, and certain labor processes in the livestock production branches are hardly yet mechanized. In the USSR the average of complex mechanization in cattle installations is 50 percent, in pork production installations 60 percent, and in poultry combines 67 percent.

A very important prerequisite for an intensive development of agricultural production and the increase in its efficiency is the hastening of technical-technological conversion and of fund appropriations. Because of what is specific to agricultural production, its degree of production fund allocations should not be smaller than that of industry. An analysis shows, however, that agricultural appropriations are far below the industrial ones in the CEMA countries, and this gap has remained virtually unchanged also in the years of the current five-year plan. At that, the changes made between 1980 and 1983 in the production fund structures of the state-farms and producers cooperatives in most CEMA countries, with the exception of Mongolia and the CSSR, are marked by a reduction of the proportion of machinery and equipment.

The development of scientific-technical progress in agriculture is linked with the achievements in machine building and the quality of machines and equipment furnished. Two problems exist here still, however. For one thing, approximately half of the trailer and tilling machines for efficient tractors, developed within the scope of CEMA's international machine system (IMS) are not being produced. And then, the high outlays for the technology (tractors, combines and so forth) often are not covered by higher harvest yields or labor productivity.

Resolving these technical and economic problems will have a positive impact on the fixed assets structure in agricultural production and its more efficient use.

Of all the measures for consistently intensifying agricultural production in the countries of the socialist community, the application of chemistry deserves high attention. Much has been done in recent years to expand production capacities for mineral fertilizer, chemical crop protection agents and means for microbial synthesis. In the 4 years of the current five-year plan, the production of mineral fertilizer climbed by more than 5.6 million tons. All told, in the CEMA countries in 1984, almost 44 million tons of mineral fertilizers (pure nutrients) were produced, 18 percent more than in 1980. The output grew the fastest in the USSR (25 percent), in Romania (25 percent) and in Vietnam (22 percent). Through such a production increase, the application of mineral fertilizers in the CEMA countries in these years could be raised altogether from 106 to 119 kg/ha, generally speaking, or by 12 percent.

The CEMA countries are setting greater store all the time by increasing the production and expanding the assortments of chemical plant protection agents. In 1984, the output rose by 19 percent above that of 1980 and came to 495 kilotons. From 1981 to 1984 the production of crop protection agents rose fast in Hungary (by 28 percent), in the USSR (21 percent), the GDR (13 percent) and the CSSR (11 percent).

In spite of that, CEMA country requirements for crop protection agents, especially herbicides, are not fully covered as yet. This calls for multilateral efforts for the further development of the fraternal countries' collaboration in producing chemical agents on the basis of specialization and cooperation.

The Production of Agricultural Commodities

Through constantly consolidating and perfecting the material-technical base of agriculture as the foundation for the intensification of crop and livestock production, through applying new forms of production management and progressive forms of labor organization and remuneration, and through using the results of cooperation, the CEMA countries from 1981 to 1984, in spite of tough weather conditions, achieved new successes in increasing the output of foodstuffs and agricultural raw materials. Total agricultural gross production in the CEMA countries had risen by 3 percent in 1984 over 1983 and 12 percent over 1980. Agricultural production developed faster in the 4 years of the current five-year plan in Vietnam and Mongolia (23 percent), Romania (19 percent), and Cuba (12 percent). In the USSR, gross agricultural output climbed by 11 percent, in Bulgaria, Poland and the CSSR, by 10 percent.

In these years the CEMA countries paid special attention to the development of crop production, so that the rate of development in that branch surpassed that of livestock production. This tendency can clearly be seen in Bulgaria, the GDR, Mongolia, Poland, the USSR and the CSSR. The focal point continues to be the further increasing of grain production. It may be observed that in the CEMA countries (not including the USSR) between 1981 and 1984 the average annual gross yields of grain have risen in comparison with those in the 1976-1980 period.

The increase lay between 7 percent in the CSSR and 20 percent in Vietnam and Mongolia. The weather in 1984 showed large contrasts. For Hungary, the GDR, Romania and the CSSR, 1984 brought a record in the gross output and hectare yields of grain and granular leguminosae. In Mongolia and the USSR, the complicated weather conditions had a negative effect on farm production. In spite of that the USSR managed to keep the volume of output on the 1983 level. The increase in the gross production of grain and granular leguminosae was achieved in the CEMA countries although their growing structure proportion of 58.2 percent in 1980 was reduced to 57.6 percent in 1984.

More sugar beets, potatoes and some other crops were harvested in the CEMA countries in 1984 than in 1983.

Of great importance to increased yields, in addition to the above mentioned intensification factors, is the cooperation of the CEMA countries in seed growing and its augmentation, which takes place within the scope of the "accord on multilateral international production specialization in seeds and crops." On the basis of that document, the USSR specializes in the seed growing of winter wheat, maize, pea, sunflower and hemp varieties and hybrids, the GDR, in the production and supplying of summer barley seeds, Poland, in sugar beets and winter rye, and Romania, in grapes. From this specialization the CEMA countries derive great economic benefits.

The close cooperation in crop cultivation started with an exchange of seeds and crops for cultivation purposes and now embraces regular reciprocal deliveries of seeds and crops to satisfy production requirements. In some CEMA countries varieties and hybrids of certain useful plants from other CEMA countries are grown over 50 to 70 percent of the total acreage. More than 70 Soviet varieties, e.g., are authorized in CEMA countries and are grown over more than 7 million hectare. The USSR, in turn, is growing from 4 to 5 million hectare with varieties and hybrids cultivated in other CEMA countries.

Livestock production was also further increased in the CEMA countries between 1981 and 1984. That is the outcome of effective measures for the further intensification of this branch and for strengthening its material-technical base through the reconstruction of old and the building of new installations and compounds facilitating the progressive technologies and modern forms of production organization and the application of the latest achievements of science and technology. The main concern there goes to qualitative growth factors in milk production and fattening.

In the outcome, gross livestock production in Bulgaria rose by 1.1 percent in 1984 against 1983, meat production, by 2.1 percent. The cows' average milk production in agricultural enterprises rose by 5.1 percent, the performance of laying hens, by 3.4 percent. The cattle inventory in Hungary remained unchanged. Pork dropped further. Meat production (fat stock) rose, however, by 2 percent, the milk production rose somewhat, and egg production dropped by 5 percent. Poland, after some decline in animal production (1981 to 1983), especially in pork production, recorded a gradual revival early in 1984. Meat production rose by 0.7 percent, milk production by 4 percent, and egg production by 5 percent against the year before. Remarkable successes are reported of the livestock

production in Romania. The cattle inventory increased by 4 percent over 1983, that of the pigs, by 6 percent, and the production climbed in meat, milk and other animal products. In the USSR livestock production average annual gross production rose by 6 percent in the years 1981-84, compared to the years 1976-80. In 1984 the heads of cattle grew by 1 percent over 1983, pigs declined somewhat, and sheep and goats increased by 8 percent. In the public sector the average milk yield from cows rose. As the result of it, the production of meat rose by 2 percent, that of milk and eggs, by 1 percent. In the CSSR, despite curtailing the cattle stock by 39,000 heads, or 0.7 percent, compared with 1983, and that of pigs by 327,000 animals or 5 percent, through a higher livestock performance the production of meat rose by 4 percent, of milk by 4 percent and of eggs by 4.5 percent. The average annual milk performance rose by 4.2 percent, that of the laying hens, by 4 percent, compared with the year before. The output of animal products has thus far in the current five-year plan risen all over in the CEMA countries, which is also true of the per capita output (Table 2).

The successes achieved in livestock production in the CEMA countries are due to a consistent intensification and the use of multilateral cooperation among the countries. Of great importance were reciprocal deliveries of breeding cattle, poultry and sperms of high-grade breeding bulls, which is constantly growing in scope. This form of cooperation was a sound basis for the further development of international socialist division of labor, specialization and cooperation in sharing the use of genetic stock. The CEMA countries in 1979 signed an international multilateral accord on the genetic stock for cattle, pigs and sheep. In line with the specialization generated on that basis, the GDR is the chief supplier of high-grade breeding cattle, Hungary, for pigs, the USSR, for sheep and so forth.

Between 1981 and 1984, these countries furnished other interested CEMA countries with some 400 breeding cattle, 2,830 pigs, more than 15,000 sheep and goats and, furthermore over 100,000 doses of breeding bull sperm. These breeding cattle are used with good benefit in developing cattle breeding in the import countries.

The Complex Cooperation Measures in Intensifying Agricultural Production

The CEMA countries are working on the draft plans for the chief trends in economic and social development for the years 1986 to 1990 and for the time span up to 2000. Connected with that is an analysis of results achieved, the discovery of positive and negative sides in economic development and the specification of the economic intensification tasks based on the accomplishments of scientific-technical progress. Special attention while drawing up these plans is paid to AIK, which is supposed to be planned, financed and managed as a unified entity. That comes with the search for the most efficient ways and means of management and planning, organization and remuneration for labor, which can still make more of the advantages of socialist economic management based on scientific-technical progress.

Merging, with maximum effect, the national R&D potentials into one uniform international potential of the CEMA countries, using the advantages of the international division of labor and with regard to the natural and economic specifics

in each country, is the most important task for the economic and scientific-technical cooperation in the agro-industrial sector.

In the CEMA economic summit declaration (Moscow, 1984) it is stated: "The participants in the conference rated the all-round hastening of scientific-technical progress as especially topical and agreed to work out jointly, on the basis of the national programs, a comprehensive scientific-technical progress program for 15 to 20 years as the basis for working out a coordinated policy, in some fields even a uniform scientific-technical policy, for the purpose of finding the fastest possible solution for the most important problems in science and technology through common efforts and handing on the results achieved to the interested countries on mutually advantageous terms." That affects the branches of AIK directly, especially agriculture, where production intensification is linked with the latest and most up-to-date means and methods of production. "For considerably enlarging the volume of capital invested in the soil," Lenin wrote, "new machines, new agricultural systems, new methods of animal husbandry, shipments of products and so forth have to be invented." (Footnote) (V. I. Lenin: "Works," Vol 5, p 103)

At that also are aimed the conclusions and proposals of the CPSU Central Committee conference on hastening scientific-technical progress. The conception presented at the conference for hastening the country's socioeconomic development, for the qualitative transformation of the material-technical base of the economy through introducing the accomplishments of science and technology, and for perfecting the management of the economic mechanism, was received with great interest in the CEMA countries.

Ensuring a stable development of AIK as a technical-technological, economic-organizational and socioeconomic task for solving the food problem remains the first and foremost strategic task in agrarian policy in the communist and workers parties of the CEMA countries. The courses for solving this task are written into the basic documents approved by CEMA--into the comprehensive program for further deepening and perfecting the cooperation and development of socialist economic integration, and the long-term target program for cooperation in agriculture and the foodstuffs economy.

Altogether the implementation of the cooperation measures envisaged in these documents had an essential influence on the further development of agriculture and the foodstuffs industry, farm machinery construction and other branches of AIK and its infrastructure.

In the CEMA countries, the degree of agricultural intensification has grown as did labor productivity, and the character of and respect for labor have changed.

In the resolutions of the CEMA economic summit and the conference of the central committee secretaries of the fraternal parties in Moscow, the priority trends for the development of cooperation were set down and the need of lifting them onto a higher qualitative level was pointed out. The declaration of the economic summit states: "The participants in the conference regard as a top priority task the utmost development of the AIK branches and cooperation in this sphere. The CEMA countries shall direct their efforts at increasing the production of food

through the introduction of progressive technologies, the development and perfection of the material and technological base of agriculture and the food industry, and also at increasing mutual deliveries of foodstuffs with the aim of improving the supply of food to the population and the consumption structure."

Much attention is paid in this connection to the implementation of the "comprehensive cooperation measures for improving the supplying of the CEMA countries' population with foodstuffs." They are an important element of the comprehensive organizational measures adopted at the 38th (extraordinary) CEMA session and aimed at the fulfillment of the economic summit resolutions.

The main trends of cooperation, as contained in the comprehensive program and the long-term target program of agriculture and the foodstuffs industry, retain their importance but are complemented and made more specific by the comprehensive measures. The measures give more substance and stronger impulses to the CEMA countries' multilateral economic and scientific-technical cooperation in the agro-industrial sector. In their implementation, 15 representative CEMA organs and five international economic organizations take part. The integration and cooperation in science, technology and production embraces all three spheres of the AIK in the CEMA countries. The priority goes to the cooperation that is linked with the development of those branches of AIK that furnish means of production, the products of which are needed for the material-technical base of agriculture, the food industry, the refrigeration and storage industry and others.

Expanding production while improving product quality is possible, as one knows, either by increasing the production potential and drawing in additional resources or through more efficient use of extant capacities, a faster introduction of the accomplishments of scientific-technical progress, and the application of the experiences of the best units. In any case, though, the growth of products and their value must be higher than the extra expenditures for producing them. If that principle is ignored, the price trend for agricultural products seen in recent years in the CEMA countries cannot long function as stabilizing factor for economic conditions ensuring a normal development of that branch of the economy.

One of the most important tasks in solving that problem lies in working out and applying fund and energy-saving technologies, which make production increases possible while the ecological equilibrium is preserved. Solving the problem of resources-saving technologies has become most relevant in crop and livestock production because in some CEMA countries the technological material and energy consumption grew faster than labor expenditure was reduced or crop yields or livestock performance improved.

The comprehensive cooperation measures envisage the development of resources-saving technologies for the most important products in crop and livestock production. In conjunction with progressive forms of labor organization and remuneration, these technologies will create the prerequisites for going into working with standards in computing the input/output ratio (yields, animal performance) with regard for natural conditions and the degree of the practical use made of the accomplishments of scientific-technical progress.

The comprehensive measures pay much attention to the agricultural application of chemistry. The CEMA countries are trying hard to increase their mineral fertilizer production. To do away with the deficit in phosphor fertilizer, one expects to cooperate in raising the production of highly concentrated and combined mineral fertilizers, the extracting of phosphorite deposits on the Chubsugul Lake (MPR), and the producing of production capacities for phosphor fertilizer, yellow phosphor and other phosphor products. Then there are also further measures of cooperation to satisfy the CEMA countries' needs for micronutrients.

The application of chemistry also provides for the broad application of anti-weed, anti-pest, and anti-plague agents innocuous to the environment.

Chemical application leads to an increase in labor productivity in field work. Not rarely, the introduction of industrialized technologies for growing maize, sugar beets, vegetable and some other agricultural crops is delayed because there are no herbicides.

One reason for so slow an increase in the efficient application of mineral fertilizers and chemical crop protection agents is the inadequate material-technical base for chemical application, the inadequate technical level of the machines and the equipment for the transport and application of chemical agents and for their storage.

The comprehensive measures contain tasks for deepening the cooperation in the chemical industry, for production increases and assortment broadening in mineral fertilizer and crop protection agents, and for the joint production of machines and equipment for the transport, storage and the application of those agents.

Great is the importance of the industrial branches of AIK for further boosting the production and improving the quality of foods. The decisive foundation for farm production yet are the soil, the agricultural cultivated plants and the domestic cattle; through them, with the help from solar energy, the product is created.

That is the reason why the CEMA countries' cooperation continues in breeding new varieties and hybrids of grain, granular leguminosae, vegetable, forage plants, fruit and berries that make a better use of solar energy, have valuable nutrients, are ecologically resistant and conform to the demands of modern industrialized technology.

More efficient use should also be made in livestock production of the biological potential.

The most important objective of the comprehensive measures is the extension and deepening of cooperation in further increasing grain, mainly feed grain, production. For an accelerated development of the grain economy, the comprehensive measures, in addition to breeding and growing highly productive assortments, envisage the development of new and the perfecting of established production procedures for grain and granular leguminosae, by using new high-capacity harvester-threshers. Also not yet exhausted are the opportunities to increase

grain production by perfecting the cultivation structure, such as expanding the kernel maize acreage in traditional cultivation areas. For the future, expanding the kernel maize acreage in the northern regions will also constitute a reserve for production increases. But that requires concrete results from meeting the agreement on scientific-technical cooperation in maize growing, especially early ripening and super-early hybrids, which would make possible the growing of kernel maize also in the northern regions of the RSFSR, the Ukraine, the CSSR, Poland, the GDR, Hungary, the USSR and Romania.

The comprehensive measures attach great importance to consolidating the feed base and raising the production of crop, animal and microbial protein.

Intended are not only higher grain yields, but also the cooperation in developing new technology and storage methods for feed grain, in increasing the yields of meadows and pasturages, in perfecting the canning and storage of bulk and juice, and in working out methods for cultivating, harvesting, transport and storage of alfalfa and soy and other granular leguminosae. Through successful work it will become possible to expand the acreages for these cultivated plants (today, granular leguminosae make up only 4 to 6 percent of the total of grain and granular leguminosae growing). If one considers the value of granular leguminosae for enriching feed rations with protein and essential amino acids and as nitrogen collector in the soil through binding nitrogen from the air, it becomes obvious that the opportunities inherent in these types of plants are too little used.

An important protein source will be the products of the biochemical and microbiological industry (feed yeast, lysine, vitamins and other food supplements). Their joint production is being planned.

The CEMA countries' cooperation in solving the grain and feed problem will make possible gradually elevating the intensity of livestock production, its capability and its efficiency. Cooperation with the industrial branches of AIK will also contribute to it, as they will supply livestock production with the technical means it needs, with means of transportation, installations for the drawing and long-time storage of the sperm in valuable breeding cattle, for its transport and for its use in artificial insemination.

Altogether the implementation of the comprehensive measures will help raise the intensity and efficiency of agricultural production and better supply the population with high-grade foodstuffs.

Länder Country	Insgesamt Total			Je Kopf der Bevölkerung per capita			per capita			per capita			per capita			per capita		
	Fleisch meat			Milch milk			Eier eggs			Fleisch meat			Milch milk			Eier eggs		
	(Schlachtmasse)			(Schlachtmasse)			(Schlachtmasse)			(Schlachtmasse)			(Schlachtmasse)			(Schlachtmasse)		
	weight--	kt	slaughtered	kt	million	pieces	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
1980	1984 ¹	1984 ²	1980	1984 ¹	1984 ²	1980	1984 ¹	1984 ²	1980	1984 ¹	1984 ²	1980	1984 ¹	1984 ²	1980	1984 ¹	1984 ²	1980
		in %			in %			in %			in %			in %			in %	
		zu			zu			zu			zu			zu			zu	
		1980			1980			1980			1980			1980			1980	
Bulgarien	781	849	109	2 217	2 560	115	2 405	2 672	111	88	95	108	250	286	114	271	298	110
Ungarn	1 566	1 825	117	2 557	2 851	111	4 385	4 239	97	146	171	117	239	267	112	409	397	97
DDR	1 899	1 988	105	7 297	7 694	105	5 514	5 772	105	114	119	104	436	462	106	329	346	105
Mongolien	227	231	102	226	252	112	21	24	114	136	125	92	136	137	101	12,7	13	102
Polen	3 141	2 500 ²	- 80	16 499	16 093 ²	98	8 902	7 642 ²	86	88	68 ²	77	464	440 ²	95	250	209 ²	84
UdSSR	15 073	16 745	111	90 899	97 614	107	66 882	75 314	113	57	61	107	342	355	-04	252	204	109
CSSR	1 499	1 536	102	5 966	6 823	114	4 900	5 504	112	98	99	101	390	441	113	320	356	111

ECONOMY

INTERNATIONAL AFFAIRS

CEMA CIVIL AIR TRANSPORT PILOT TRAINING SCHOOL DESCRIBED

East Berlin VOLKSARMEE in German No 47 1985 (signed to press 18 Nov 85) p 10

/Article by Dmitri Zassorov: "I Got Off the Airplane During the Landing Approach"--Visit to the CEMA Pilot Training School in Ulyanovsk/

/Text/ I obtained permission for this flight from Honored Pilot of the USSR Viktor Rzhevsky, deputy director of the Joint Training Center for Flying, Engineering and Air Safety Personnel of the Civil Air Transport Companies of the CEMA Countries in Ulyanovsk. Full of curiosity, I enter the cockpit of the Tu-134. Even though I have never before touched a joystick, I am offered the copilot's seat. I feel a little funny about this, and I settle for the flight engineer's jumpseat. I find the mass of fittings in front of me and above me somewhat confusing. There are more of them here, it occurs to me, than in the control center of a power station. The flight mission states: takeoff and landing, or, in pilot vernacular, one go-around. To take off, make a turn and line up for a landing is probably about the most difficult task in aviation.

The takeoff is smooth, the turn has been made, and we are starting the final approach. The instruments clearly provide all the necessary information: altitude, speed, and other things. Suddenly pilot Aleksandr Yeshotkin reports that the landing gear will not lower. The flight engineer calmly states that he will "fix this" immediately. The aircraft gains altitude and once more prepares for final approach. This is repeated several times. The constantly repeated operational sequences are beginning to bore this non-participant and I decide to get off. I step out of the flight simulator, which the pilots use to familiarize themselves with that aircraft model, in the middle of the final approach.

This group of buildings of the center contains simulators for every type of aircraft as well as operators' consoles for ground aircraft controllers and dispatchers. In other words, all possible and impossible flight scenarios can be reproduced at the center. I find myself surrounded by highly sensitive electronics. "This center was founded in 1935 and at the time modestly called itself Advanced Flight Training Course for Civil Air Transport," says Deputy Director Valdimir Deldyushov. "Pilots of bombers and transport aircraft were trained here during the Great Patriotic

War. After the war the courses were reconverted to civil aviation. In 1981 the center became a CEMA facility. Since then experienced flight commanders, pilots, navigators and ground controllers have gone back to school here. The students do not have to pass an entrance examination, but experience, college degrees, or at least 3 years of college are prerequisites.

"Why do experienced people have to go back to school?" I ask.

"There is no other way in today's aviation," says Vikto Rzhevski. "New generation Soviet aircraft are introduced in many international airlines: the Tu-134, various modifications of the Tu-154, Il-62 and Il-86. Even experienced pilots must retrain for them. Even the second class of the Jak-42, which uses small airports required that the pilot undergo special training. There is great interest in this new aircraft. This turboprop model operates very economically and can be used for short or medium runs. At the moment we are swamped with applicants for the Tu-154M. This upgraded model uses 20 to 25 percent less fuel than its predecessor, the Tu-154 B."

"What does the specialists training consist of?"

"We are dealing here with retraining, more specifically, familiarization with the new equipment and an upgrading of flight procedures. In the beginning there are classroom sessions and the flight simulator. Then there are actual flights. But since we are dealing with experienced pilots, we do mostly without cross-country flying and use 90 percent of the time for local takeoffs and landings. But even for this the flight captains require 3 months. Copilot training takes a little longer."

During the past four and one-half years thousands of specialists from the European socialist states have been retrained here, as have others from Angola, Syria, Libya, Vietnam, Cuba, Korea and China. At the moment things are a little quieter in the center. One course has just concluded, but the replacements are already arriving--one specialist group each from Guyana and the GDR.

A few years ago I asked the director of Moscow's Little Theater, Mikhail Tsaryov, prior to his theater's guest appearances in the Mongolian People's Republic, how he planned to overcome the language barrier. His reply was brief: "Art needs no translation." Surely no one will deny that flying is an art also; but here, more than anywhere else, it is important to explain to the students the smallest details of such a complex piece of machinery as an aircraft. Thus the question of communication certainly commands attention here. Viltor Rzhevski calms my worries: "The European pilots all speak Russian. For pilots from Arab countries for example, we provide simultaneous interpretation. Our working languages are Russian, English, French, German and Spanish."

This year the Ulyanovsk center will be 50 years old. Its graduates fly on all continents today. I believe they all have fond memories of their training time in Ulyanovsk.

ECONOMY

CZECHOSLOVAKIA

FORMER CZECH ECONOMIST EVALUATES CSSR SYSTEM

Stuttgart OSTEUROPA in German No 11, 1985 pp 813-826

[Article by Jiri Kosta, Dr. rer. pol., Csc. oec., Professor of Economics (specialty: Socialist economic systems) at the University of Frankfurt/Main: "Relaxed Central Planning--Without Success"]

[Text] On Economic Development in Czechoslovakia

It is an old experience that pressure for reform increases with growing functional weaknesses of Soviet type planned economic systems. Czechoslovakia (CSSR) is an eloquent example of the interrelationship between economic crises and reform attempts. The growth and supply crisis of the early 1960's was followed by an economic reform whose fate was sealed by the foreign policy intervention in August 1968 and the ensuing, forced change in course of the country. A temporary upswing at the beginning of the 1970's, under the conditions of an essentially centrally-directed planning system, made possible mostly due to favorable external factors, but also containing system-inherent weaknesses, was superseded by a trend of recessive growth, which led to a critical decline in development around 1981/1982 and brought about new discussions of reform.

Economic Starting Situation

The growth rates of national income produced (Table 1) not only show the gradual slackening of the development road of the Czechoslovakian economy after 1975, but also indicate that actual figures remained permanently behind the corresponding target figures.

We have reproduced both the gross and net values of national income, because Czechoslovakian publications in the years after 1982 juxtapose the former growth rates of the net national product with the comparatively higher growth of the gross product. This makes for a "rosier" picture.

The obvious downswing of the Czechoslovakian economy in the period of 1976 to 1982 was strained by a number of difficulties to be indicated here only with keywords. It was a matter of increasing shortages in basic materials and energy, the country's continuously deteriorating foreign trade position, supply problems in the agricultural sector, etc.

Table 1: Annual Growth of the Czechoslovakian Economy 1971-1983 (in percent)

		1971-75 ¹	1976-80 ¹	1976	1977	1978	1979	1980	1981	1982	1983
National Income Produced											
Gross ₂ Value	Target	5.3	5.2	5.3	5.2	4.9	4.3	3.7	2.8	0.5	2.0
	Actual	5.1	4.0	4.6	4.3	4.5	3.4	3.3	0.8	0.6	2.6
Net ₃ Value	Target	5.1	5.0	5.0	5.1	4.6	4.0	3.5	2.5	-0.2	1.6
	Actual	5.7	3.7	4.2	4.2	4.1	3.1	2.9	-0.1	0.2	
2.4											
National Income Spent											
	Actual	6.1	2.2	3.1	1.6	2.7	1.1	2.7	-3.4	-1.6	0.7

¹ Annual average; ² Gross material product (including write-offs);

³ Net material product (without write-offs).

Source: Statisticka Rocenka CSSR 1983, pp 136-138; 1984, pp 127-129; Economic Survey of Europe in 1983, Geneva/New York 1984, p 125.

It would be all too simple to attribute the unfavorable development of the Czechoslovakian economy only to causes inherent in the functional problems of the central planned economy system. Similar to other countries deficient in raw materials, whose high degree of industrialization implies strong foreign trade dependency, the CSSR was hit in an almost catastrophic manner by the deterioration of the terms of trade which, subsequent to two oil price shocks, raised the price level of raw materials in proportion to the prices for industrial products to an extent unknown before. A further difficulty for the CSSR economy consisted in the recession in the West, which considerably impaired the absorption capacity of the markets in the capitalist industrial countries. (Compare J. Kosta, F. Levčík: Economic Crises in the East European CEMA Countries, Cologne 1985, p 7 ff.).

In addition to unfavorable external conditions, one must also take into account internal problems not directly attributable to central-directive planning: such as the more costly raw material deposits, and increasing stress on infrastructure and environment in extraction and processing of raw materials. In particular, the enormous quantities of West Bohemian brown coal, extracted by strip mining, constitute an impairment of the environment with which the CSSR economy was unable to cope. Furthermore, there is the economic structure, imposed through foreign policy and running counter to the country's natural conditions, which led to a one-sided predominance of heavy industry due to the political conditions after World War II, and which was further expanded through total

integration into the CEMA bloc (compare text further on, and J. Kosta: Outline of the Socio-Economic Development of Czechoslovakia 1945-1977, Frankfurt/Main 1978).

Well-Known Functional Shortcomings of the Economic System

Despite these influencing factors external to the system, the crisis tendencies in the CSSR must be attributed largely to the system-inherent weaknesses of the centrally directed planned economy (in which East bloc integration can also be considered caused by the system).

Table 2: Average Annual Productivity Growth in the Producing Sectors of the Czechoslovakian National Economy 1971-1982 (in percent)

	1971-1975	1976-1980	1981-1982
Work productivity	4.8	3.1	-0.1
Capital productivity	-0.1	-2.4	-5.9
Total economic productivity	2.35	0.3	-3.0

Source: J. Kosta, L. Levčík: Economic Crisis in the East European CEMA Countries, Cologne 1985, p 31.

The indicators listed in Table 2 point to three decisive weaknesses of the Soviet planning system, which was essentially reestablished after revocation of the reform elements of the 1960's, i.e.:

- first, the waste of resources, expressed in low work and capital productivity,
- second, the lack of structural adaptability to changing basic conditions,
- third, the enterprises' lack of willingness to introduce technical and organizational innovations (J. Kosta: Economic Systems of Existing Socialism, Cologne 1984, p 92).

The functional weaknesses mentioned become very clear if we focus on the development data of the CSSR national economy in the international context. The example of use and consumption of energy resources is particularly characteristic for the waste of production factors. Compared to the two Western industrial countries of Austria and the FRG, the energy-intensity in the CSSR was almost three times higher, a fact which is not attributable to a more favorable consumption level in family households, but rather to extremely high losses of energy use in industry and in transporting energy (R. Dietz: Energy Economy in East Europe and the USSR, Vienna/New York 1984, pp 34 and 39 ff.).

The two other shortcomings of the system--difficulties in structural adaptability and slowness of innovation--can be seen in the results of CSSR Western exports. According to computations by the Vienna Institute for International Economic Comparisons, the loss of market shares for CSSR

exporters amounted to 33.1 percent between 1970 and 1980, in the case of the GDR and Hungary, 20.8 and 21.4 percent, respectively. The CSSR share of exports of machinery and other technological products, typical for the technological level, to worldwide imports of this class of goods dropped from 2.1 percent (1970) to 1.47 percent in 1980 (F. Levčík, J. Skolka: East-West Technology Transfer. Study of Czechoslovakia, Paris [OECD] 1984, p 20).

Basic Features of Reform Measures from 1978 to 1981

On 1 January 1978, a "complex experiment for controlling the efficiency and quality of production" was introduced in about 150 enterprises which are united in 17 production associations; in Czech terminology, "economic production units" (VHJ) (HOSPODARSKE NOVINY, 2/1978, supplement).

The emphasis of the corresponding directives was placed on utilizing monetary instruments and strengthening material incentives. The basic tendencies of the "complex experiment" consist, on the one hand, in a combination of small steps of decentralization, and in centrally administered regimentation, on the other hand, but not in a reform concept oriented to market economy (ibid.). On the basis of allegedly positive experiences with this experiment (F. Chval, J. Černý, in: REVIEW OBCHODU PRUMYSLU, HOSPODARSTVI, 7/1980, p 80), the government in 1979 passed a new resolution which has been called a "complex of measures of the system of planned direction of the national economy after 1980" (RUDE PRAVO, 14/3/1980). Based on the appropriate resolutions, at the beginning of 1981 measures specified in the document were introduced in industry as well as in the construction and service industries.

Overall, the reform steps can be seen as an attempt to relax somewhat the present economic plan system in order to increase efficiency without shaking the foundations. It appears that this is a case of a compromise between different opinions of experts that had to be accommodated. As will be shown, this impression is also confirmed by the discussions of the problem in CSSR trade journals in recent years. (Our statement is based on articles in the trade journals PLANOVANE HOSPODARSTVI, HOSPODARSKE NOVINY, and POLITICKA EKONOMIE, which will be quoted later on.) The spectrum of opinions, which becomes only partially visible in the above-mentioned document of resolutions, ranges from the evidently less influential economic scientists advocating a larger reform to those economists aiming only at improvements in the economic index system and forms of incentives, whereby the instruments of central-directive planning are possibly even to be expanded.

Administrative and Managerial Structure: Small Changes

The structure of administration has hardly changed under the resolutions of 1980. The leading role of the party, the strong position of the state planning commission, which continues to enjoy a predominant place vis-a-vis the numerous sector ministries, subordination of the VHJ syndicates under the ministries, and last but not least, the enterprises

operating at the lowest level of the managerial pyramid--this order corresponds to the traditional Soviet-type administrative structure. There are, however, a few new accents and peculiarities.

The VHJ as the middle management level (it corresponds approximately to the combines in the GDR) is to be expanded, to a much greater extent than up to now, as a fundamental member of the administration. VHJ was created in 1958 as a counterbalance to the overly powerful ministries of industries with their former central administrations, and later on was reorganized several times. Of the three VHJ types--the horizontally organized "trust", and the two types of "syndicates," usually of vertical organization--the strongly centralized type of syndicates, sometimes called combines, was recommended as the prospective form after 1980. According to the complex of resolutions, the general managers of the syndicates now fulfill--vis-a-vis the central authorities--the function of planning executant, tax payer, fund manager and borrower, whereby action by the central authorities and banks against individual enterprises has been greatly reduced, albeit not eliminated. (V. Stepanik, in: FINANCE A UVER, 6/1984, p 393).

It must be conceded that certain limits have been put on the decision-making authority of the management of the syndicates vis-a-vis the enterprises, which are probably not as tight in all cases as they appear at first glance. Overall, however, just a listing of the manifold functions of VHJ would show the strengthened position of the mid-level administration, both vis-a-vis the central authorities and at the level of individual companies. Also, it cannot be overlooked that a side-by-side existence of large, medium and small enterprises is being advocated, and the arguments for it, because they are plausible, do not need to be repeated here.

National Economic Planning: New Elements

The 5-year plan is to be the basis of planning; incidentally, a demand made time and again in earlier declarations of intent by the political leaderships. The complex of measures demanded that the goals of the seventh 5-year plan (1981-1985) be incorporated in a forecast stretching to the year 2000, formulated in "complex development programs" and finalized in "state target programs," which was to be linked with the "long-term target programs" of CEMA. Finally, to be determined in the 5-year plan were the "basic tasks" and "limits of funds," including "normative material stimulation." (On the following, see J. Kosta, in: OSTEUROPA-WIRTSCHAFT, 2/1982, p 96; L. Strougal, in: Ke zdokonaleni plano-viteho rizeni narodniho hospodarstvi, Prague 1980, pp 15-42, 123-128, and Sbornik statí ke zdokonaleni soustavy planoviteho rizeni narodniho hospodarstvi, Prague 1980, pp 30-37).

On the one side, the basic tasks take the shape of quantitative indices: among them are indicators such as "selected products in commodity units," "deliveries for investment building according to sectors," "operation of new industrial installations," "production tasks in selected new issues,"

"deliveries for export according to sectors," "exports of complete installations," etc.; on the other side, the reform measures deal with qualitative indices, among them: "profitability of funds of fixed assets," "work productivity compared to company performance (i.e., net product)," "differential indicator of foreign trade and domestic prices," "kilogram prices of export goods."

Among the numerous binding indices to be incorporated in the 5-year plan, which are to express efficiency and satisfaction of demand better than the previous target indices (gross production, investment volume, etc.), the new index of "adjusted company performance", conceived as a measuring stick of success, stands out. This indicator of the "type of net production" (gross production minus the costs of materials) forms the basis for normatives, especially for stimulation funds (see later in the text).

In allocating the 5-year plans, "tolerance limits" (values from - to) are to be allowed. In the yearly plans, individual binding indices are no longer to be set, but rather the above-mentioned normatives. Assumption of greater planning tasks by the enterprises through "counterplans" are recognized through higher wage and premium allocations. In case of non-fulfillment of the plans, post facto cuts have to be made. The document and all commentaries stress that the stability of targets set over a period of several years and economic rules, i.e., normatives, tax rates, etc., are a prerequisite for the effectiveness of the extensive and sophisticated plans. On the other hand, it is conceded that long-term plans under changed basic conditions, especially in view of interlocking international relationships, should not be set once and for all.

This shows an almost unsolvable contradiction between the principle of stability of planning on the one hand, and flexible adaptation of the national economic plans on the other hand. The rapid changes in world market prices after the second oil price shock of 1979, in particular, made price adaptations necessary which delayed preparatory work on the national economic plan. Thus the VHJ and enterprises received, much too late, the necessary information regarding their particular plan targets. Up to then, "the economy" was directed "essentially according to the yearly plans which deviated from the original plan targets." (NOVE SLOVO, 6 Sep 1984, p 4f.; also compare V. Kadlec: Rok 1984 ekonomicky, in : LISTY, Rome, 1/1985, p 34 f.; this article by a formerly prominent economist, published in the exile journal, bases its critical statements on a great number of quotations from the CSSR trade press.) It shows that the intention of giving up, in the annual state plans, the traditional plan indices such as production targets and input allocations in favor of normatives, was not implemented.

In Soviet-type planned economies, balance-sheets of materials have always been one of the fundamental instruments of coordination between the availability of a product and its use. The fact that balancing has partly been moved from the central authority to the middle level of decision-

making, i.e., the VHJ, will hardly justify the hoped-for improvement of the coordination mechanism.

The commercial contracts between supplying and purchasing enterprises are based on the balance-sheets and plan indices. The institution of commercial contracts is being reevaluated in several regards (Sbornik, op. cit., p 38). Firstly, the parties to the contract are under much greater administrative and economic pressure to conclude the contract which formerly--as is being stressed now--frequently never materialized. Discharge of the contractual obligation is incumbent upon the Office of State Arbitration. Secondly, special emphasis is placed on concluding contracts covering several years whose life, as a rule, is to correspond to the 5-year plan period. Thirdly, there is to be reciprocal influence between plan drafting and contract negotiations, whereby the commercial contract is possibly to be signed before fixing the plan targets.

Increasing Importance of Monetary and Economic Incentives

The growing importance of monetary management forms and economic incentives can be clearly observed in the CSSR in the late 1970's. In the above-mentioned list of measures, this trait is usually euphemized with the well-known term "Chosrastschot." In detail, it is a matter of a) the financial scope of the enterprises, b) the problem of prices, and c) economic incentives.

Financial Scope of Enterprises: The principle of self-financing of investments is to be applied fully in the VHJ. (On this point, see: L. Ler, discussion paper, presented at a panel of functionaries on the occasion of the passing of the complex of measures, in: Ke zdokonaleni, op. cit., pp 114-122 [Ler is finance minister and chairman of the government committee for questions of planned management of the national economy] ; Sbornik, op. cit., pp 43-61). In the first place, self-financing is to be given greater importance, and there is to be more leeway than before for loans, while financing from the government budget is to be greatly reduced. Even if such a procedure could be implemented, it could only affect the VHJ--if the stipulations of that document are followed--but hardly the individual enterprises. As a rule, only the syndicates are authorized to redistribute the profits and losses achieved in the individual enterprises. The financial scope of the individual enterprises remains relatively narrow.

The funds of the enterprises are an important instrument of monetary management and stimulation. The document distinguishes between two types of the funds of VHJ and enterprises: financing fund and stimulation fund. (For more detail, see J. Kende: Czechoslovakia: Goals, Problems and Strategies of Economic Policy during the Early 1980's, Berlin 1982, pp 59-65). The individual funds are fed on the basis of the above-mentioned formatives. Basically it is a matter of putting a part of the profits achieved into the funds concerned, according to precisely fixed conditions and depending on the most important indicators of success (adjusted company performance, fund profitability, export targets, etc.), and

according to certain percentage rates. In order to use the funds as levers, the levies of the enterprises, especially profit transfers, have been reduced. The financial leeway in the sector of formation and use of the funds is greater on the VHJ level than at the level of individual enterprises.

The Problem of Prices (M. Sabolcik, Discussion paper [see above, Ler], pp 130-136; the same, in: *PLANOVANE HOSPODARSTVI v letech 1984-1985*, D. 1-10; R. Gruenwald, in: *POLITICKA EKONOMIE*, 7/1984, pp 735-744; F. Vencovsky, in: *PLANOVANE HOSPODARSTVI*, 8/1984, pp 22-27): It is still a much discussed, but open, question in how far prices are to be considered and established as "values," according to the criteria of cost and/or utility value, that is to say, according to their use and limited availability.

In the traditional system of the centrally planned economy, the domestic production enterprise was protected from external price influences, since the state foreign trade enterprises carried out their transaction at world market prices, and the differences were charged to the national budget. The change in the terms of trade made it obvious that, under these conditions, the already existing barriers against a structural adaptation were especially great. The necessity of letting changed international price relations influence the relative prices of the domestic economy, gradually gained acceptance.

Under the term "rationalization of the price system" (M. Sabolcik, op. cit., pp 4ff.; V. Janecek, in: *PLANOVANE HOSPODARSTVI*, 8/1984, pp 46-57), during a first stage--from 1979 to 1982--the prices for fuels were raised annually. In 1981, a price increase for other imported raw materials was added, and in 1982, prices were also increased for additional basic and other materials being produced on the basis of the much more expensive raw materials. In a few exceptional cases, however, wholesale prices were lowered.

Through cost savings in the processing industry and in transportation, passing on the price increases to consumer goods prices was to be avoided as far as possible. That this intention could not be carried out is not only indicated by price increases, such as the price raises for meat, tobacco and alcohol, officially announced at the beginning of 1982 (Kosta, *Neuere Entwicklungen*, op. cit., p 96). Probably much more serious were the hidden price increases: evidently, the enterprises made extensive use of the chance to mark higher prices for "new" products, as permitted by the regulations under the keyword "price stimulation." Efforts by the authorities to stop such practices came up against the limited information capacity which makes effective price control impossible.

It is not possible for the outsider to estimate the increase in the level of retail prices, and the extent of state support which is to keep the price index for consumer goods within limits. Developments from 1981 to 1985 resulting from these and other changes in wholesale prices, are listed by an employee of the Federal Price Office with the following figures (V. Janecek, in: *PLANOVANE HOSPODARSTVI*, 8/1984, pp 46-57):

Price increases of fuels, in total	+ 72.3 %
Among them:	
Imported raw materials	+111.1 %
Domestic fuels and raw materials (including agriculture)	+ 54.4 %
Increase in wholesale prices of all products	+ 17.2 %
Among them:	
Finished products	+ 12.2 %

Not covered in the decisions on price policy is the question at what level of decision-making price formation should take place. Evidently, liberalization of price decisions is not being considered. The statements on uniform guidelines for cost accounting do give the impression that prices are fixed by the Federal Price Office for only a part of the diverse goods categories. Certainly, a certain amount of pricing authority is vested at the enterprise level, since only here is the necessary information about individual cost components available. But in this case, also, the VHJ probably has greater pricing authority--within the framework of central directives and controls--than individual enterprises.

Economic Incentives (Ke zdokonaleni, op. cit., pp 61-66; Sbornik, op. cit., pp 81-82; J. Kosta, Neuere Entwicklungen, op. cit., p 97): Among profit incentives in the widest meaning of the word must be counted all monetary instruments; therefore, not only payment for work, but also prices, credits, interest, exchange rates, etc. We want to limit ourselves here to only those which are directly effective in the form of wages and premiums.

Wages as a "fundamental component" (complex of measures) of compensation for work, which continue to be determined by national pay scales on the basis of job and qualification classifications, are set with the help of normatives dependent on the index "adjusted self-performance." This means a relinquishing of the priority position of "gross production," which up to now was the main measure of success, often expressed through the index of work productivity, and which brought about the known effects of waste (Kosta, Neuere Entwicklungen, op. cit.).

In addition to the amount of wages, the premium fund is also fixed on the basis of normatives. While wages are considered costs, the premium fund--and similarly, the stimulation fund--is formed by setting aside a part of the profits achieved. As a rule, its amount depends on fulfillment of the index "profitability of the fund of fixed assets" and other, company-specific efficiency indices. On the average, basic wages of all workers and employees are to be about 80 percent so that premiums make up the remaining 20 percent. It is up to the VHJ syndicates to decide the criteria which are of importance for the premiums of individual employees. None of it can be considered a new phenomenon.

Reform Measures in Agriculture

In September 1981, the government passed a bill called "principles of a perfected system of planned management of agriculture" (HOSPODARSKE NOVINY, 45/1981, supplement). The direction of impact of the regulations in question correspond to the measures in effect for one year in the secondary and tertiary sectors, respectively. Therefore, the reform attempts in the agricultural sector can be interpreted only as a limited relaxing of the continuing centralistic-directive planning system. (On the following, see Kosta, *Neuere Entwicklungen*, op. cit., pp 97 ff., and ZEMEDELSKE NOVINY, 5 Nov 1981).

In the government resolution, special attention is paid to planning within the framework of the so-called "economic agrarian-industrial complex;" one can interpret this somewhat nebulously defined structure as the coordination form of agricultural cooperatives and state farms as well as their supplier and buyer organizations, whose activity is coordinated by higher authorities. By involving all individual segments, production and purchase plans, appropriate input plans (work force, wages, investments, basic and auxiliary materials) and the major indices of financial planning are to be coordinated reciprocally. With the documents at hand, it is difficult to analyze how this interlocking of individual and overall plans is brought about and how it functions.

For agricultural enterprises, the rules are analogous to those for industry. The annual plans result from the targets of the 5-year plan, where the system of counterplanning is also to be applied. Among the binding indices in the resolution--their number was reduced--, purchase quotas for grain and animals for slaughter are listed, and "at the most, three" further items. Natural planning and balancing is to provide the requirement limits of fodder, fuels and energy, as well as the figures for other needed operating means (fertilizer, seed grain, machinery, etc.).

As for monetary management forms, in a balance-sheet table for 1982 the document compares the financial requirement and yield flows. On the requirement side of the balance-sheet, higher buying prices, "differential surcharges" and "growth premiums" are to effect a production increase; on the yield side, subsidies for fodder mixtures were cut, and prices for operating means were adjusted upward, which is to stimulate more economical use of resources. The resulting negative balance (a 2.9 billion korunas overage in requirements) was to be financed from the national budget.

1983-1985: Old Problems---Further Measures

The following data will show how difficult the situation looked at the beginning of 1984: according to official statistics, the level of private consumption rose by 0.8 percent compared to 1978, that of retail sales by 0.4 percent; average real wages dropped by 2.6 percent, per capita consumption of meat by 2.2 percent, and housing construction even fell 26

percent. With regard to the development of the national income, on the basis of CSSR price statistics one comes realistically to the same conclusion as F. Levčík: "A necessarily rough estimate indicates that the net material product at realistic constant prices during 1981 and 1982 dropped by more than 6 percent compared to 1980." (EUROPÄISCHE RUNDSCHAU, 2/1985).

It would certainly be too limited a perspective if one were to interpret the crisis development of the early 1980's as a consequence of the complex of measures introduced on 1 January 1981. First of all, factors not inherent to the system were involved, such as the terms of trade, and secondly, in any system reform one must expect a time lag, since the aimed-for effects of economic policy can never materialize immediately. Nevertheless, at least by 1982 a certain effect of the measures should have been noticeable, as the authors had expected. Continuation of the extensive growth trend, continued inefficiencies, the noticeable reserve of enterprises vis-a-vis innovations--all this is not only criticized time and again in the trade press, but also in statements by politicians and commentaries in the mass media. (Compare, among others, V. Janza, in: Planovane hospodarostvi, 5/1984, p 4; S. Sourek, *ibid.*, 9/1984, p 1.)

The indicators characteristic for the functioning of the control system, and therefore especially for the reform measures introduced after 1980, should have shown a more favorable picture by 1982 or 1983, at the latest. This does not change because of the fact that there was a slight increase in the production growth rate in 1983 which continued in 1984 (compare Tables 1 and 3).

Even if the dates in Table 3, based on official statistics, are not considered inflated, the theory of an upswing is untenable (and this is even truer if one calculates the statistical errors, as shown in the table). As the table indicates, even work productivity before 1983 did not yet surpass the level of 1980 and grew by an annual average of only 1 percent during the last 4 years. During the same period, capital productivity dropped by about 15 percent.

Table 3: Efficiency Indicators of the CSSR national economy (1980 = 100 at 1977 prices)

	1981	1982	1983	1984
1. Work productivity	99.6	99.8	101.7	103.8*
2. Capital productivity	94.6	89.3	87.5	84.8*
3. Material intensity	100.7	101.8	102.6	102.9*
4. Energy intensity	99.2	98.0	97.0	95.0

* Estimated

1. National product per employed person. 2. National product per unit of fixed assets; 3. Material input (previous work) per unit of national product; 4. Primary energy consumption in Terajoules per unit of national product.

Sources: Statisticka rocenka CSSR 1984, p 128; Plan fulfillment report of the Staistical Federal Office for 1984, in: RUDEPRAVO, 28/1/1985, quoted from: F. Levčík, Economic Development, op. cit., Table 4.

The only partial success was registered in the energy sector. Here, indeed, savings were achieved, although they are due to rigorous administrative measures (cutting-off of electricity at given times, darkness in the cities, etc.).

Proof of the in reality inadequate technological standards of Czechoslovakian products can be seen in the unsatisfactory results in the export markets. This is no wonder when--as proven by one author--kilogram prices for exports from Western industrial countries came to \$8.44 per kg at the beginning of the 1980's, while exports from the CSSR reached a price of \$2.6 per kg. (E. Klívacová, in: HOSPODARSKE NOVINY, 49/ 1984, pp 8-9. In the trade literature one assumes that, in a competitive market, a relatively higher price per kilogram of a metal product sold represents an indicator of a comparatively higher technological level.) The insufficient competitiveness of CSSR export goods in Western markets, a result of the low technological level, is also confirmed by an OECD study in 1984: between 1979 and 1981, export of technological equipment and other investment goods ("engineering products"), price-adjusted, dropped by 6.1 percent (Levčík/Skolka, op. cit., p 44).

In Table 3, one important efficiency indicator is not taken into account, i.e., stocks on hand. At present, the output in the CSSR is statistically recorded both on the microlevel and the macrolevel at completion of the production process, i.e., before the moment of sale. There are constant complaints about unsold stock. A member of the State Planning Commission criticized at the end of 1983 that "the amount (of stockkeeping) in industrial organizations with 90 percent of the annually produced national income (during the years 1966-1970) constitutes a great part of idle work (an average of 65 percent) (L. Smid, in: PLANOVANE HOSPODARSTVI, 12/1983, p 3; M. Kerous, ibid., 6/1985, pp 54ff.).

If one interprets the data listed in Table 3 and the above-mentioned statements on uneconomical inventory holding, it becomes clear that at least up to 1984, system weaknesses such as inefficiencies, production not geared to needs, and sluggish reaction to innovations have not been overcome since the measures were introduced in 1981. In the weekly economic journal published by the Communist Party one could read that, in an editorial conversation of leading managers with the chairman of the State Planning Commission, it was pointed out time and again that the enterprises received too many plan requirements from above and could, therefore, only be concerned with fulfilling the plan indices, rather than the interests of the enterprise. While the plant managers pleaded for fewer plan directives, the government member advocated "perfectioning of planning." (HOSPODARSKE NOVINY, 25/1983, pp 6-9; also compare, ibid., 20/1985, p 9).

As mentioned above, the authors of the reform packet intended to dissuade industrial management, with the aid of "counterplanning," from covering up their plan reserves. If, in the course of plan formulations, the enterprise assumes higher production quotas, lower input allocations, more favorable efficiency indicators, etc.; in short, if it assumes on its own "harder" plan indices than set down in the planning authority's original guideline plans, then the normative rates provide for an increase in the amount of wages and premiums. In case of falling below the guideline figures, the pay funds are cut.

An analysis of the use of the instrument of counterplans in the country's Czech Socialist Republic shows that the expectations of the authors of the complex of measures were not fulfilled during 1981 to 1984 (J. Macek, P. Smula, in: *PLANOVANE HOSPODARSTVI*, 4/1984, pp 51-60). Experiences in Slovakia were similar. A local author lists a number of reasons which, in her opinion, explain the failure of counterplanning. According to the economist, "the major problem consists in the enterprises' fears that, if they toughen the plan requirements on their own, the ministries and VUH will frequently correct the planned target according to the preceding plan fulfillment (i.e., increase it all around), without taking into account the goals of the 5-year plans, and also without taking into account the appropriate advantages, such as wages, increasing premium funds, etc." (V. Sysakova, in: *EKONOMICKY CASOPIS*, 6/1984, p 558f.) The problems of counterplanning, extensively described in both articles, indicate that neither the problems of information or of interest, both Achilles heels of directive plan centralism, have been overcome.

1983-1985: Some New Reform Elements

Having recourse to the experiences made with the 1981 list of measures, the CSSR government decided at the beginning of 1983 to introduce further experiments, concerning three areas in particular: scientific-technical progress, investment financing, and organization of foreign trade. (L. Ler, in: *HOSPODARSKE NOVINY*, 9/1983, pp 1, 5; *SVET HOSPODARSTVI* 29/9/83, pp 1-2; *PRAVDA*, Bratislava, 13/4/1984, pp 1, 4; S. Bukac, in: *PLANOVANE HOSPODARSTVI*, 9/1984, pp 1-8).

The technological level is to be raised with the aid of improved plan indices, normatives related to them, price formation, and rules of financing, which are to be applied as a lever for promoting innovation. With regard to investment financing, under the experiment the separation of the two funds--the present development fund for decentralized investments and the reconstruction fund for centralized investments--is to be abolished. Now, a uniform fund is to be established, fed mostly by company funds and write-offs. Investment credits are to be granted under stricter conditions than up to now, and subsidies from the national budget will be granted in exceptional cases only.

In foreign trade, two new organizational forms are being introduced on an experimental basis, which above all are to promote exports to the West. In the first form, the state foreign trade enterprise acts as the agent of

the production plant, that is, it acts in its own name, but on account of the producer. This regulation is to apply to vehicles, laboratory equipment, and other product types. The second form consists in the organizational and economic incorporation of the former foreign trade enterprise, or one of its departments, respectively, in the production unit (for example, in case of pumps, products of high-voltage technology, etc.). Furthermore, for those industrial enterprises manufacturing products for export, the binding index of "foreign currency for documents" is being introduced. With the help of these instruments, the shortcomings of insufficient market orientation are to be overcome, and the lacking incentives for enterprises producing for export are to be created.

The reports published so far on the effects of these new reform attempts are not exactly encouraging. As reported at the beginning of 1985, new technologies continue to be accepted only hesitantly. "Scientific-technical progress, and innovation activity by the enterprises, so far has not become the decisive method and determinant of intensification...., the economic efficiency of exports is not growing to the required degree; with a view to construction investment, excessive dispersion of construction capacities and overly long construction periods continue to be criticized" (V. Cap, in: *PLANOVANE HOSPODARSTVI*, 2/1985, pp 10 and 15).

CSSR economists and politicians continue to criticize openly the operating method and the results achieved by the spring of 1985, after introduction of the measures. However, the conceptual conclusions from the failures reached by economic scientists are divergent. The more influential experts, whose opinion will probably be reflected in future decisions of the political bodies, are advocates of a "progressive structural change, better plan indices and normatives, more precise balance-sheets, more sophisticated calculation methods, better qualified management, etc.; but in their opinion, central-directive planning is to be maintained. (Compare also J. Hvorecky, in: *PLANOVANE HOSPODARSTVI*, 7/1984, pp 1-7; M. Fremer, *ibid.*, 9/1985, p 3; J. Mervart, in: *POLITICKA EKONOMIE*, 1/1985, pp 61-72.) Only a minority of economists--at least as far as publications are concerned--advocates a market-oriented reform which is to change the old system. (In some articles, mostly based on theoretical arguments, the plea for a system-changing reform a la Hungary is made very indirectly; among others, compare J. Goldman, K. Kouba: *Terms of Trade, Adjustment Processes, and Economic Mechanism--A quantitative approach*, in: *Acta Oeconomica*, Vol 32, p 1f.; M. Kerous, *op. cit.*, p 59).

Within the framework of the "strategy of perfecting," and on the basis of a resolution by the Central Committee presidium of the Communist Party of the CSSR and the Czechoslovakian government published in the fall of 1983, to become effective in 1986, work was begun to "further perfecting the system of planned management of the national economy, and with a view to preparing the eighth 5-year plan" (*RUDE PRAVO*, 7 Sep 1983, p 1). As a result of the corresponding program preparations, the government published a document on 13 September 1984 with the title, "major directions of the further development of the complex of measures to perfecting the system of planned management of the national economy." In addition to verbose and

generalized statements on present and future reform steps, this document presents some more concrete measures, some of which were introduced in 1983 (see above) and 1984, others referring to future years (HOSPODARSKE NOVINY, Nos 42 and 43/1984, supplement). To list a few of these old-new elements:

- The success indicator, "adjusted company performance," is to be modified through deduction of loan interest and inclusion of profits or losses, respectively, from foreign trade operations;
- central and decentralized investments--in the latter case, now without the fixed maximum amount (until now, 2 million korunas)--are to be financed in all enterprises from a uniform investment fund (see above);
- economic results achieved in foreign markets are to be included in the profitability accounting of the production plants, and in selected cases, this also holds true for subcontractors of primary products;
- present criteria for price formation, in particular reference to world market prices, are to be better taken into account than up to now. For certain consumer goods, not only the retail price but also the wholesale price based on the former is to balance supply and demand and to indicate shortages;
- wage differentiation is to be advanced more energetically; for managerial staff, a larger portion of their work income is to be tied to success;
- the position of the purchasing plants is to be strengthened vis-a-vis the supplier enterprises.

One must, however, see as relative the increasing utilization of monetary control forms and the tendency to decentralize decisions, which is occurring here and there. First of all, most of the statements in this resolution are general and vague indications of a tendency. Secondly, and more importantly, the decentralized elements are counteracted by numerous centralistic-directive control forms; among them are: preset or centrally fixed economic and sector target programs, central investment projects, import and export quotas, indices in the form of instructions, limits, priorities, etc.

The economic policy options in the CEMA countries cannot be selected autonomously by the CSSR leadership. For one, the structural framework of economic development is largely determined by being tied into the CEMA bloc. For another, the more difficult basic conditions for domestic and foreign trade during the last decade impose further limits on a small, industrially developed, but raw material dependent country like the CSSR, within which the political decision-makers have to act.

Final Remarks

If one notes the slight upswing during 1983 and 1984, one must ask if the decisive turnaround has not happened, after all. The cyclical movement of East European national economies, known from earlier periods and much studied (Kosta/Levcik, op. cit.), this time is moving on a much lower level of upswing than before. The growth rates of the last 2 years, rather

low by East European standards (according to official statistics, the net material product rose by 2.4 percent in 1983 and 2.6 percent in 1984, the national income spent domestically rose by 0.7 and 1.7 percent respectively; see Levčik, Economic Development, op. cit., Table 3), indicate that the desired turnaround was not accomplished, after all.

The fact that the 1983 decline was halted, nevertheless, and that moderate growth rates were achieved, is probably due less to the success of the control instruments and planning forms used, and more to the somewhat improved basic conditions: the latest development of world market prices, more favorable sales opportunities in Western markets, and the backlog demand potential which accumulates during every downswing phase of a planned economy. Insofar as the small reform steps, carried out in 1981 and supplemented in 1983, had success, it must probably be attributed to administrative planning pressure--such as tougher consumption and performance norms--rather than to economic levers.

In summary, the economic order presently established in Czechoslovakia can be characterized by the following essential traits:

- Central fixing of target plans on the basis of a closed household economy for the enterprises for production of goods and services, as well as allocation of production factors.

- Use of monetary criteria and incentive forms, to influence favorably performance and efficiency.

- A tendency toward decentralization of the administration from the state and ministerial level to that of the sector institutions (VHJ in the CSSR, the combines in the GDR, Objedineniya in the USSR, associations of enterprises and large agro-industrial enterprises in Bulgaria, etc.). Individual enterprises, subject to the general management of sector associations, continue to have limited leeway in the available decision-making process.

If one attempts to compare and systematize the reform types of socialist economic systems which have developed in CEMA countries since the 1970's, then the present order of economic planning in the CSSR corresponds to the type of loosened plan centralism to be found in the Soviet Union, the GDR, Romania, and in somewhat divergent form, also in Poland and Bulgaria. Hungary is the only CEMA country which attempts to implement a larger reform concept oriented toward market economy.

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ECONOMY

GERMAN DEMOCRATIC REPUBLIC

UNIVERSITY RESEARCH INTEGRATION INTO INDUSTRY VIEWED

East Berlin DAS HOCHSCHULWESEN in German Vol 33 No 10 Oct 85 (signed to press 14 Aug 85) pp 277-288

[Article by Dr Michael Goerig, research group leader in the Central Institute for University Education in East Berlin: "Ensuring Quick and Effective Utilization of Economically Significant Research Results From University Level Institutions"]

[Text] The further development of our national economy puts the highest challenges to quick and efficient utilization of research results in national economic practice. Analyses of higher education research results point out, however, that it is exactly this transfer that is not sufficiently mastered in the system of managing and planning scientific-technical progress. From the point of view of higher education research it is especially necessary to intensify cooperation of higher education institutions and their practice partners--from the establishment of goals and tasks to the critical evaluation of research results and their transfer and application to practice. (Footnote 1) (cf "The Tasks of Scientific and Educational Policy at Our Institutes of Higher Education in the Academic Year 1983/84" (From an address by the minister for higher and specialized education at the conference of higher education directors on 4 and 5 July 1983 in Koethen) in: DAS HOCHSCHULWESEN Vol 9/1983 p 256. "Good Results at Higher Education Institutions at the 35th Anniversary of the GDR--Stable Basis for Further Achievement Increase" (From an address by the minister for higher and specialized education at the conference for directors and board members of higher education institutions on 2 and 3 July 1984 in Dresden) op cit Vol 9/1984 p 225) In general terms, transfer must be more intensively placed into the center of management activity--with practice partners, state authorities and also higher education institutions--i.e. management must participate effectively in the organization of successful practice, and must create the necessary conditions for a transfer process that is as uncomplicated as possible. It happens too often that it is left up to those responsible for subject matter development and their practice partners alone if and how they attack the problem of transferring research results.

As regards subject matter development important for a quick and effective utilization of higher education research results, a number of research projects were performed by the Central Institute for Higher Education in the context of ZP [central party] project. (Footnote 2) (cf Goerig M, et al, "Conditions

and Challenges in Guaranteeing Quick and Effective Utilization of Higher Education Research Results Important for the National Economy" Central Institute for Higher Education, Berlin 1984, Scientific Work Reports, 1984) In agreement with the annual reports of higher education institutions, the projects point out that in general terms there is a successful transfer of higher education research results into social practice. At the same time, essential problems and reservations in the transfer process became evident. The research projects prove that the decisive capacities for increasing the effectiveness of the transfer process lie especially in subjective factors and in conditions of management and organization.

Cooperation With Practice Partners--A Key Condition for Successful and Quick Transfer of Higher Education Research Results

Transfer of higher education research results to industry works especially well when there are the conditions and the will to meet each other halfway on both sides, and when the transfer field is bridged through cooperation, and therefore does not become "no man's land." A complex method of cooperation with practice partners that is based on trust and mutuality and extends over as long a period as possible, the practice partners here being the true utilizers and producing agents of research results, is of special importance in this regard. In this way the necessary objective as well as subjective conditions for quick and successful transfer of higher education research results can be created. There is no way of giving administrative directions for the necessary attitudes, thought processes, and the sense of responsibility on both sides, as well as for understanding the partner's job, all of these things develop as a rule only through cooperation and active discussion.

An important experience teaches that the decisive basis for all forms of cooperation is the establishment of content and scope of responsibility. If the common problem area is exhausted or if the development of basic research requires a change of content orientation in basic or applied research, existing partnership combination or forms of cooperation must be changed in as much as they cannot deal with the new research content.

The following factors have proven to be conducive to effective cooperation:

--agreement and interrelation of higher education research strategies with development strategies of their practice partners.

By interrelation of strategies must not be understood, however, that basic research in higher education will subordinate itself unilaterally to the strategies of the practice partners. On the contrary, basic research must decisively influence the strategies of practice partners, must prepare important conditions for the development process of these strategies. Therefore, special importance is assumed by the strengthening of analytic, prognostic and strategic activities for the determination of most promising research directions and for avoiding erroneous developments. This requires, among other things, intensive concept work and mutual influence in higher education institutions and among practice partners.

--joint, simultaneous work on research problems by higher education institutions and practice partners.

Parallel work on different achievement levels by higher education institutions and practice partners as well as application-oriented research work done by companies in conjunction with basic research work performed by higher education institutions are measures that save time, assure transferable results and decrease costs of transfer preparations by higher education researchers.

--mutual personnel exchange, temporary employment of higher education researchers, and the purposeful use of graduates by practice partners.

On this point, research has come up with many examples (e.g. mutual personnel exchange is about 20 percent of research projects performed). There are no essential differences between higher education institutions in the utilization of this very effective possibility. In one of the cases researched by us no personnel was sent to higher education institutions by the practice partners, but "only" planning positions were prepared. As useful as planning positions may be for the expansion of the research capacity of higher education institutions, the important effects of personnel exchange are not fully utilized in this manner. Practice partner personnel, on the basis of their understanding for research gained in their work at higher education institutions and of their identification with research jobs, can, e.g., influence "from below," so to speak, (supplementing the activities of management) the readiness of practice partners to utilize research results and solve ongoing problems.

--organization of a joint scientific life with practice partners.

Only in a few of the test cases a joint scientific life between practice partners was found to exist. These few examples, however, demonstrated the high effectiveness of joint scientific life for research, transfer and utilization of research results. Such forms of scientific life as joint monthly research seminars (applied and basic research-oriented), annual meetings, courses of instruction, such as those that are used by the FSU [Friedrich Schiller University] mathematics department and the VEB Cooperative Carl Zeiss, Jena, on the MATMOS complex, have set important conditions for an effective cooperation, a change in attitude and thought process by company personnel, and have prepared the groundwork for effective work by graduates.

--close contacts between higher education institutions and practice partners on all levels (management as well as manufacturing).

A direct, close cooperation on the manufacturing level without fixed organizational form and by way of the "lower level chain of authority" has proven especially effective on several occasions.

The tests also prove that the technical practica established at several higher education institutions are effective links between higher education institutions and industry in order to prepare practice personnel to transfer research results, and to guarantee development of the research results that is appropriate to transfer conditions and compatible with technology. It is noteworthy

that through the work in technical practice an immediate cooperation of higher education researchers in companies was not necessary during transfer of research results (e.g. in a joint transfer collective); sufficient was a consultative cooperation used only when problems arose. This practice saves time and also benefits the research capacity.

The conditions created by technical practice in higher education institutions and the total progress made through the cooperation of higher education institutions and practice partners are, however, not yet sufficient. On the part of industry, these conditions must be supplemented by creating conditions for flexible cooperation with higher education institutions and for quick transfer of higher education research results; because now as before, cooperatives are not accepting, or accept only reluctantly, a number of valuable research results of the higher education system. Often the amount of possible products and the effective production are too small for industry, or the introduction of new technologies appears too costly and risky. But frequently these research results of the kind that will lead to new products, to a discharge of NSW [non-socialist economy] import loans, to good export possibilities and to meeting urgent needs of the national economy. Thus, higher education institutes often undertake development work and try by various means to interest potential manufacturers. Often they are not successful because some of their work remains, in spite of its high level of useful maturation, below the "attractiveness threshold" of the cooperatives. Thus it seems urgently necessary to create in the cooperatives flexibly reacting, intelligence-oriented sectors, i.e., from small to medium-size firms that are especially in tune with particular departments at higher education institutions (and central institutes of the AdW [Academy of Sciences]), and that accept research results that are below the "attractiveness threshold" of the current R&D sections of the cooperatives. In an analogous manner to that of the technical practice of higher education institutions, higher education researchers and students should be employed in these production sectors. In many cases the transfer of products and technologies developed in firms/sectors of this kind through the R&D and production sectors of cooperatives will be possible and necessary. At other times however development and production will remain in these firms/sectors.

The broad and effective utilization of many-sidedly usable research results, i.e., the transfer, accomplished as quickly as possible, of research results to all potential users who can make socially effective use of them, results in special challenges to the cooperation of higher education research and social practice. The tests show that the processes of multi-stage transfer of research results are less well organized and materialized, and are not managed as consistently. In general, the many-sided utilization of research results cannot be considered satisfactory--in spite of many explanations and appeals on the part of management. Higher education institutions can, as a rule, count on only one or a few potential users when they produce application models. Where results are concerned that are important for the national economy and have a wide potential circle of users it seems important that strong conditions for wide ranges of transfer are created by industry as well as central and local authorities; especially for partners who do not have any, or only small, R&D capacity.

The following patterns, obtained from the tests, appear useful for this purpose:

--Engineering Firms and/or Offices

Temporary or permanent engineering offices--as individual units or attached to a company--offer good conditions for quick, consistent and appropriate development of research results that are of special importance for the national economy where they can be used in many sectors. For different kinds of application, different kinds of development and project work are as a rule required. It would be inconsistent if every potential user company performed development work on the basis of the results supplied by higher education research. Also, many potential users frequently do not have sufficient R&D capacities of their own. Higher education researchers should work side by side with engineering firms of this kind and give scientific instruction.

--Interest and Users' Associations

The merger of potential users--possibly with inclusion of economic authorities--to interest and users' associations offers favorable conditions for quick and broad transfer of research results. As an example can be cited the interest and users' association on research results "Lasergravur" of the FSU, Jena, that was established in 1982 with active support from the MWT [Ministry of Science and Technology] and the bezirk planning commission Gera. Twenty-five cooperatives and companies are members of this association which operates under the scientific leadership of FSU.

--Application Centers

The joint establishment of application centers by producers and higher education institutions is an effective method of quick and broad transfer of research results into practice. These application centers have the following purposes: training of users, information of potential users, adaptation to users' specific conditions, and others.

It also seems advantageous to us to create structured units in selected cooperatives and companies that function as coordinators between basic research--applied research--development and production, i.e., as coordinators between higher education institutions and AdW institutes on the one side and the R&D sectors and production sectors of cooperatives on the other side. In these units, too, higher education researchers should work along directly. An example of a department working in this way at the VEB WF [Television Electronics Firm] Berlin--with cooperation of the Humboldt University--demonstrates the positive result of this work method--the mutual influence, follow-up, and constant cooperation during ongoing research work as well as the testing of results that are appropriate for transfer into practice. This is effective for basic research as well as research result transfer and for the formation required on both sides, of attitudes, thought processes, knowledge and interrelation of strategies on basic research and development in the companies.

International development tendencies (member countries of the RGW) in regard to the improvement of WTF management structure also point increasingly toward

the development of flexible forms of coordination and cooperation of scientific-technical work, and toward the creation of specialized transfer organizations which are expected to contribute especially to the proliferation of research results and to guarantee transfer help for companies. (Footnote 3) (cf "Opyt organizacija, planirovanija, finansirovanija i ekonomiceskogo stimulirovanija sozdaniya i vnedreniya novoj tehniki v stranach-clenach SEV/Rukovoditeli raboty" Prokudin V; Starodubrovski V; Cucamacenko B, Moskva, Mesdurnarodnyi naucno-issledovatel'skij institut problem upravleniya, Sovet Ekonomiceskoj Vzaimopomosci, Sekretariat, 1984, p 202 Translation of title: "Experience at the Organization, Planning, Financing and Economic Stimulation in the Creation and Transfer of New Technology in RGW Membership Countries) (Footnote 4) (cf Struwing H G, Kaiser H, "Management Experiences in Scientific-Technical Progress in European RGW Countries" in: GESELLSCHAFTS-WISSENSCHAFTLICHE INFORMATIONEN [Sociological Informations], AdW of the GDR, WIZ, Berlin G/2/1984 6 (1984)2)

Beside the continued development of scientific production associations, problem-oriented structured units and engineering centers have been established, e.g., in the USSR. The President of the AdW of the Ukrainian SSR, B Paton, justifies the establishment of these centers by pointing out that under the present-day transfer system it is not always possible to guarantee large-scale materialization of scientific research results in the national economy. (Footnote 5) (cf Paton B, "Engineering Centers: From Concept to Production" in: PRAVDA 3 Jan 1985 p 2) The new engineering centers at individual AdW institutes are expected to offer, on the one hand, conditions for intensive completion of planned basic research and, on the other hand, complete carefully new technologies and products, and prepare their transfer on a broad scale.

Completion of Research Goal and Purposes--Starting Point for Transfer Preparation

Basic and decisive conditions for effective transfer are research results with high scientific-technical quality and strong innovation character. These results must meet the immediate needs of society, must correspond to the requirements and possibilities of the national economy and society.

Our tests show that the following conditions are especially important for the transfer possibility of research results:

- goals and purposes that are developed jointly with practice partners;
- completion of critical written records that contain clear explanations/decisions/plans for use and transfer of research results;
- critical and effective completion of initial project defenses;
- development of application possibilities and economic effectiveness of planned research results, and their gradual elucidation during the research process.

Initial project defenses have special importance for the guarantee of usefulness, for the start of preparations and for transfer into practice. This

assumes that the potential user of research results and in certain cases also representatives of local and central authorities are included in the initial project defense, that there is critical discussion about purpose and goal of the project, and that arrangements are made for the actions necessary for utilization of the planned results and for preparing their transfer into practice. Analyses of defense procedures at higher education institutions (Footnote 6) (cf Goerig M, Wenzlaff H, "Defenses--Effective Instruments of Successful Research Work" in: DAS HOCHSCHULWESEN, Vol 6/1984 p 153) point to a number of problems that appear precisely during the phase of initial project defense.

Preparation and transfer must begin with the development of goals and purposes. Schedules and planning decisions for the preparation of transfer must therefore be part of the written accounts that are obligatory. In case of relatively high uncertainties in regard to the transfer of research results into practice, as it is often the case in basic research, statements should at least be made on possible fields of utilization, potential users and on the estimated importance of the results for these sectors/users. That does not mean that in basic research the definition of purpose is to be oriented exclusively on the immediate transfer of research results into practice, because this would considerably limit the effectiveness of basic research. Economically successful, useful research results can often not be recognized or evaluated as such during the basic research phase. It is only in the course of a gradually developing research and evaluation process that economically successful, useful results can be selected. If possible or available problem solutions are too strongly limited during the basic research phase, it can happen that projects are eliminated that are economically precisely the most effective. For this reason, basic research results that have not yet been utilized in social practice, constitute "an important scientific-technical solution potential that increases the reaction capacity and flexibility of the national economy in market and resource situations." (Footnote 7) (cf Maier H, "Problems of Strategy Development Under the Conditions of the Scientific-Technical Revolution" in: "Increasing the Contribution of Basic Research to the Innovation Strength of the GDR National Economy, GESELLSCHAFTSWISSENSCHAFTEN-Academy of Sciences of the GDR, Berlin GW 28 - 5 May 53)

Our investigations showed clearly that interest of practice partners in research results can only be aroused only if the partners can recognize the quality and effectiveness of the results. For early and binding work on transfer it is important to establish, as concretely as possible, a definition of utility effectiveness and potential negative effects, and of the funds required for transfer and utilization. The logical evaluation of quality and effectiveness of research results is therefore of eminent importance. These evaluations are to be made as the research process progresses and are to be based on the particular state of progress that can be evaluated each time. This is important not only for obtaining high quality research results but also for the readiness of practice partners to accept the results as early as possible. Here, the assessment of scientific quality is in no way sufficient. And this includes the results of basic research. Even if, in the latter case, the possible degree of concreteness is essentially lower, at least the tendencies of influence on certain important factors of the national economy and the importance of research results for the development of definite areas of practice should be estimated.

Higher education institutions have only limited possibilities for determining economic quantities. Experience teaches the following: The more research projects are application-oriented, the closer they are conducted at the dividing line between higher education institutions and practice partners, the more strongly and responsibly practice partners are to be included in determining economic quantities. In several of the projects evaluated, determination of economic quantities was made with active participation of practice partners, and often in true cooperation. In some projects, employers working in conjunction with higher education institutions, played a special part in determining economic effects. But in defining the latter there are frequent arguments. The blame lies in part with the fact that definitions of this kind often result in "arguments" or that the partners (on both sides) are not in a position to analyze economic effects and applications. In some cases, practice partners even demanded that the higher education institution submit requirement investigations. In this context it became obvious that the market research work of some practice partners was deficient.

In agreement with the results of analyses of the obligatory research documentation the investigations found that not enough consideration is given to the fixation of make-believe goals and to explanations for the purpose of license granting at the development of goal and purpose determinations. Obvious in this connection is also the fact that comparisons with internationally leading products are often not made in consistent fashion.

Preparation Time, Deadlines for Research Results

Not enough attention is paid, in part, to these factors during the development of goals and purposes, at initial project defenses and also in the course of research processes. Important for good time progress during the preparation phase are, especially, a parallel preparation of research and development projects and, parallel to this, preparation and realization of transfer. Whereas parallel research and development is successfully practiced in a number of projects, parallel research and planning of transfer were noticed in only a few projects. Parallel conduct of research and transfer realization is the exception. Only one single example was found; in this case, realization of transfer took place parallel to research and development with active support by local authorities. Through extensive parallel preparation work, transfer times (starting with submission of research results) of below 1 year could be achieved in several of the investigated projects (analysis transfer). Of essential importance for achieving good development times in research are the sufficiently concentrated utilization of research potential and the guarantee of larger time contexts for higher education researchers in developing their research tasks. It is noteworthy, however, that in discussions the concentrated utilization of work groups and their potentials was pointed out only rarely; and then even with the limitation that concentration should not be overestimated, that the technological development of research and the specifics of the research process should be noted.

As obstacles to achieving better development times the discussion partners mentioned especially the lack of risk readiness on the part of practice partners, and also the fact that a number of regulations (among others ordering and shipping deadlines) work against short-term or parallel preparation or realization of transfer.

The deadline for submitting research results contributes to their effectiveness. For the projects investigated, the majority of those responsible for the projects thought overwhelmingly that the submission deadline for their research results corresponds with the needs of society. The following reasons for delayed submissions of results were discovered:

--decisions are delayed for too long,

--late reactions to situations developing in practice, research work was started too late, the first research phases could have been completed more quickly,

--wrong prognosis of development tendencies by scientists.

The investigations also show that no general directions or even "recipes" can be given for speeding up the work. For each project it is necessary to investigate, with consideration for its importance for the national economy, what work speed is necessary and what the chances of realization are.

Influence of Scientists and Higher Education Directors on Transfer and Utilization of Higher Education Research Results

Our investigations prove that often great efforts and prudent action by higher education scientists are indispensable for overcoming a great number of objective and subjective problems in regard to successful transfer and utilization of research results. In principle, the coresponsibility for transfer is accepted by the great majority of higher education scientists. Clear progress has been made in recent years in regard to the influence of the higher education administration on transfer. Critical comments by scientists that some higher education administrations limit their activities too much to appeals and explanations, however, point out the necessity of further activating the influence role of administrations and of supporting scientists effectively. Frequently those responsible for projects do not have specific knowledge of potential producers, of planning and financing conditions, they do not have connections to local and central authorities that must cooperate in the decision process on transfer preparations. These deficiencies can often be remedied only by efforts consuming much time. This is true especially for sectors that have a larger number of potential users and producers for their research results so that no long-range and close cooperation with practice partners can be organized. Positive experiences in solving these problems are found in, among other places, the Soviet Union. At the Moscow Textile Institute, e.g., a special sector "economic effectiveness and transfer" supports higher education scientists in organizing the activities necessary for transferring their research results to practice partners. (Footnote 8) (cf Martynov I A, Sazin B S, "Uskoraetsa Vnedrenie Resultatov NIR, in: VESTNIK VYSSEJ SKOLY Vol 2/1984 p 31; translation of title: "Transfer of Research Results Accelerated") FRG higher education institutions take a similar approach. There, transfer departments established at several higher education institutions are considered to be very helpful to scientists. (Footnote 9) (cf "Higher Education and Economy--Possibilities and Obstacles of Cooperation" in: INFORMATION: EDUCATION, SCIENCE, Bonn, Jul-Aug 1984, Ministry for Education and Science) In the GDR, too, there are some initial experiences